

Preschool teachers' insights about web-based self-coaching versus on-site expert coaching

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Implementation science defines training and coaching as two important competency components to support fidelity of implementation of evidence-based practices. The present study explores the perspectives of 21 preschool teachers, located in the United States, about the professional development (PD) they received, which included training and coaching. The PD was designed to support their planning, implementation and evaluation of embedded instruction practices for young children with disabilities. The PD involved: 16.5 hours of workshops distributed across four to six weeks; the provision of job-aids; and 16 weeks of on-site coaching or 16 weeks of prompts to engage in self-coaching using a project-developed website. An interpretivist theoretical perspective of symbolic interactionism using grounded theory methods was adopted to guide the analysis of focus group data obtained from teachers following their participation in the PD. We describe the components of the PD that teachers characterized as effectively transcending the web-based and on-site coaching, the challenges they experienced with embedded instruction implementation and their recommendations for enhancing coaching. Implications are offered for considering individual and environmental factors that influence knowledge acquisition and practice implementation in the classroom and sustaining teacher learning through follow-up implementation support.

Keywords: preschool; professional development; coaching; web-based coaching; implementation fidelity; teachers' perspectives

Introduction

Providing professional development (PD) that prepares and supports a knowledgeable and skilled early childhood workforce is receiving significant attention in the United States in both research and policy contexts (Zaslow *et al.* 2010, Rhodes and Huston 2012, Winton *et al.* [in press](#)). Informed by principles from implementation science, PD that includes training and coaching has been identified as important for enhancing practitioners' competence and confidence to implement evidence-based practices with fidelity (Snyder *et al.* 2011, Metz and Bartley 2012). In early childhood PD there has been a renewed emphasis on ensuring practitioners have the knowledge, skills and dispositions to design high-quality learning environments,

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implement evidence-based interactional and instructional practices, and use child progress and outcomes information to inform and refine their practices (Winton *et al.* *in press*).

A significant corpus of recent research has focused on characterizing the features of PD necessary to achieve measureable change in teacher practice and related child outcomes (Pianta *et al.* 2005, Desimone 2009, Snyder *et al.* 2011, Diamond *et al.* 2013). Among the PD features identified to date are: PD is sustained over time rather than episodic, one-shot experiences; PD is focused on a specific curriculum or set of explicit practices rather than general teaching methods; and PD includes the provision of job-embedded supports, using systematic approaches that involve teachers' implementation of practices in the classroom and reflection, as well as providing specific feedback about practice implementation from a coach, mentor or peers. A meta-analysis conducted by Joyce and Showers (2002) suggested that features of PD associated with what they termed 'executive implementation' of practices in classrooms included a combination of pedagogical strategies such as theory and discussion, plus explicit demonstrations of practices in training, plus practice with feedback in training, plus coaching in the classroom. Based on estimates from their meta-analysis, these authors noted that PD including all of these features would achieve fidelity of implementation as high as 95%.

Several recent studies have contributed quantitative evidence about noteworthy impacts of PD on practitioners' implementation of evidence-based practices, particularly when the PD included coaching (Snyder *et al.* 2012). Coaching in these studies focused on supporting implementation of an explicit and coherent set of environmental, interactional or instructional practices associated with positive developmental and learning outcomes for young children, including children at risk for learning challenges or those with identified disabilities. Coaching included systematic and cyclical processes of collaborative goal-setting related to practice implementation, providing repeated practice implementation opportunities in job-embedded contexts and engaging in guided reflection with explicit feedback about implementation. This form of practice-focused coaching was demonstrated to be effective for enhancing teachers' implementation of social-emotional practices (Fox *et al.* 2011, Hemmeter *et al.* 2011), positive behavior support strategies (Artman-Meeker and Hemmeter 2012, Vo *et al.* 2012), interactional practices (Pianta *et al.* 2005), literacy practices (Diamond and Powell 2011, McCollum *et al.* 2013) and mathematics practices (Rudd *et al.* 2009).

Despite promising evidence, policy-makers, training and technical assistance providers, and practitioners identify coaching as a time-intensive and cost-intensive form of PD. Much remains to be learned about what forms (e.g. expert coaching, peer coaching), delivery formats (e.g. face to face, web-based) and doses of coaching are reliably associated with desired levels of practice implementation for which practitioners and under what circumstances. Unpacking these and other features of coaching is needed to support increased access and flexibility of use (Snyder *et al.* 2012). Moreover, as practice-focused coaching gains increased momentum in implementation science, it is important to examine practitioner perspectives about features of PD that are viewed as acceptable and feasible to support professional learning and implementation of evidence-based practices.

The present study is a qualitative analysis of focus group data obtained from pre-school teachers who participated in PD designed to support their implementation of embedded instruction practices for young children with disabilities. Embedded

instruction is a multicomponent approach for providing learning opportunities for young children with disabilities in the context of naturally occurring classroom activities, routines and transitions (Snyder *et al.* 2013). The PD for teachers in the present study included: 16.5 hours of small-group workshops distributed across four to six weeks; the provision of job-aids for planning, implementing and evaluating embedded instruction; and 16 weeks of coaching provided either on-site by a project-trained coach or through prompts and access to a self-coaching website. The focus in the present study was on teachers' perspectives about the PD and coaching they experienced as well as the extent to which the PD supported their implementation of embedded instruction practices when coaching form and format were varied, but dose frequency was balanced. Using a grounded theory approach, the following research questions guided the analyses:

- (1) Which features of PD effectively transcended the coaching delivery forms (self versus expert) and formats (web-based versus on-site)?
- (2) Which features of the web-based self-coaching or on-site expert coaching facilitated teachers' perceived competence about implementing embedded instruction practices?
- (3) What were teachers' implementation challenges under the web-based self-coaching condition or the on-site expert coaching condition?

Study context

The data were obtained as part of a larger potential efficacy study that involved 36 preschool teachers of young children with disabilities which focused on the impact of a multicomponent PD intervention on preschool teachers' use of embedded instruction practices (Snyder *et al.* 2013). Teachers were enrolled from three school districts located in three states and were randomly assigned at each site to one of three experimental conditions: face-to-face workshops plus on-site coaching ($n = 12$); face-to-face workshops plus self-coaching via a project-developed website ($n = 12$); and business-as-usual PD offered by the school districts ($n = 12$). Coaching implementation data showed that all teachers in the on-site coaching condition received 16 weeks of coaching, but only 2 of the 12 teachers assigned to the self-coaching condition used all available features on the self-coaching website. Eight teachers assigned to the self-coaching condition used one to three of the available features on the self-coaching website while two teachers did not access the self-coaching website during the study. Teachers assigned to the self-coaching condition displayed lower levels of implementation of embedded instruction learning trials in their classroom, when compared with teachers who received on-site coaching. Teachers in both coaching conditions, however, wrote higher-quality embedded instruction learning targets when compared with teachers in the business-as-usual condition.

Participants

Certified teachers working in preschool classrooms of three school districts located in Florida, Wisconsin and Washington participated in the study. The focus of the present study was on teachers enrolled in the two coaching conditions who participated in focus groups at the end of the study and not teachers receiving

business-as-usual PD. Ten of 12 participants in the self-coaching condition and 11 of 12 participants in the on-site coaching condition consented to participate. Years of early childhood teaching experience for self-coaching teachers averaged six years (standard deviation = 4) while the on-site coaching teachers averaged 9.3 years of experience (standard deviation = 6).

Coaches

A project-employed coach trained in both the practice-focused coaching protocol and embedded instruction worked with teachers in the on-site coaching condition at each site. All coaches had experience as early childhood teachers and experience with research. One coach had a doctoral degree and the other two coaches had master's degrees.

Professional development intervention

The 16.5 hours of interactive workshops were distributed across four to six weeks at each site. Teachers received job-aids (including implementation guides, activity matrixes and video cameras) for use during and after workshops. Active learning strategies were used throughout the workshops and included video exemplars, case studies and application exercises to implement in the classroom between workshop sessions. Across both coaching delivery formats, a practice-focused coaching approach was used. This approach involves specification of a targeted set of practices, needs assessments completed by teachers related to implementation of practices, goal-setting and action planning, observation/self-observation, reflection and performance feedback (Snyder *et al.* 2009). In the present study, 14 embedded instruction practices were specified and focused on what to teach, when to teach, how to teach and how to evaluate embedded instruction implementation and child learning outcomes (Snyder *et al.* 2013).

On-site expert coaching

Each teacher in the on-site condition participated in a face-to-face coaching orientation followed by coaching in her classroom. The coach followed a systematic coaching protocol to enact the practice-focused approach. On-site sessions typically consisted of live classroom observation by the coach, followed by a meeting between the coach and teacher that included reflective conversation and provision of performance feedback. On-site coaching occurred every other week for 16 weeks. On alternate weeks, the coach contacted the teacher by email, telephone or video-conference to review the action plan and embedded instruction implementation activities carried out by the teacher following the reflection and feedback conducted during the previous week. The coach therefore had weekly contact with the teacher for 16 consecutive weeks.

Web-based self-coaching

Each teacher in this condition was given a face-to-face orientation to the self-coaching website. The orientation provided information about navigating the self-coaching website, self-coaching processes supported by the website and forms/materials

located on the website. Instructions and forms available on the website for teachers to self-coach aligned with the on-site coaching protocol (i.e. self-assessment of needs, goal-setting and action planning, self-monitoring and self-evaluation of embedded instruction and child learning outcomes). After the orientation, teachers had access to the self-coaching website for 16 weeks. When teachers accessed the website, they would see a tip of the week related to embedded instruction and articulated website navigation videos highlighting key website features. Teachers in this condition were sent a weekly email from research project staff that encouraged them to visit the website, engage in self-coaching, complete self-coaching forms and view new resources or exemplar videos for embedded instruction and the tip of the week.

Method

An epistemological stance of constructionism and an interpretivist theoretical perspective of symbolic interactionism guided the inductive analysis (Crotty 2011). According to Blumer (1969), symbolic interactionism abides by three fundamental assumptions: ‘human beings act toward things on the basis of the meaning these things have for them’; ‘that the meaning of such things is derived from, and arises out of, the social interaction that one has with one’s fellows’; and ‘that these meanings are handled in and modified through, an interpretive process used by the person in dealing with the things he/she encounters.’ Research within this perspective seeks to develop theory about the relationship between participants’ perspectives of their context and the meaning they assign to both objects and experiences within that context (Crotty 2011).

Data generation and collection

Focus group data were collected at the conclusion of the potential efficacy trial as a component of gathering social validity data from teachers about the feasibility, acceptability and utility of both coaching and embedded instruction. A total of six focus group interviews, lasting one to two hours, were conducted across the three sites (one for each condition at each site) using a semi-structured interview protocol. Members of the research team who were not directly involved in coaching facilitated the focus groups. All sessions were audio and video recorded and transcribed for analysis. Completed transcripts were read concurrently with the audio for accuracy and tone. Quotes presented have been altered for readability in two ways: grammatically, including syntax and punctuation; and speech disfluencies (e.g. like, um, er) have been removed. In the quotes presented below sites are labeled A, B, and C. Within each site there were participants who received expert coaching (EC) and self-coaching (SC). The numbers represent the lines from the original transcription document.

Data analysis

Transcripts were analyzed using the constructivist grounded theory method, which emphasizes learning about the dimensions of experience or action embedded within relationships, situations and systems over time (Charmaz 2006). Additionally, constructivist grounded theory seeks to describe action in relation to meaning, including the participants’ assumptions, their intentions and the consequence of their actions on the world (Charmaz 1996). Although the method emphasizes grounding findings

in the data, it must be acknowledged that the researchers' background, interests and familiarity with the field lend foundational concepts to the process, serving as 'points of departure' for further theoretical development (Charmaz 1996, p. 32).

Two focus group transcripts, one from each coaching condition, were coded line by line using gerund-based phrases (e.g. using new materials, assuming, feeling frustration), which supported an understanding of the phenomenon grounded in the data. The data and codes were reviewed and words/phrases were collapsed into more theoretical focused codes (e.g. awareness of students), which were applied to four additional transcripts, two from each condition/location (Glaser 1978, Charmaz 1996). When new concepts arose, previous transcripts were recoded. This interactive process led to categories that subsumed multiple concepts and focused codes (e.g. 'intensive coaching supports' combined collaborative partnership, accountability for implementation and access to feedback), which, in turn, explicate the properties and relationships among the focused codes (cf. Glaser 1978, Charmaz 1996, 2006).

The movement from code to category was facilitated throughout the analysis by the process of memo-writing – a method for recording emergent understanding of the data, which grows increasingly theoretical over time (Glaser and Strauss 2009). Finally, a theoretical model was designed to illustrate the categories and their relationship to one another (see Figure 1). Notably, the credibility or trustworthiness of this work lies in the reader's ability to find meaning within the categories and model described (Creswell 2013). In addition, the analytic process was systematic and included measures of quality such as use of an audit trail, the constant-comparative method, peer debriefing and disconfirmatory cases (Branlinger *et al.* 2005, Creswell 2013).

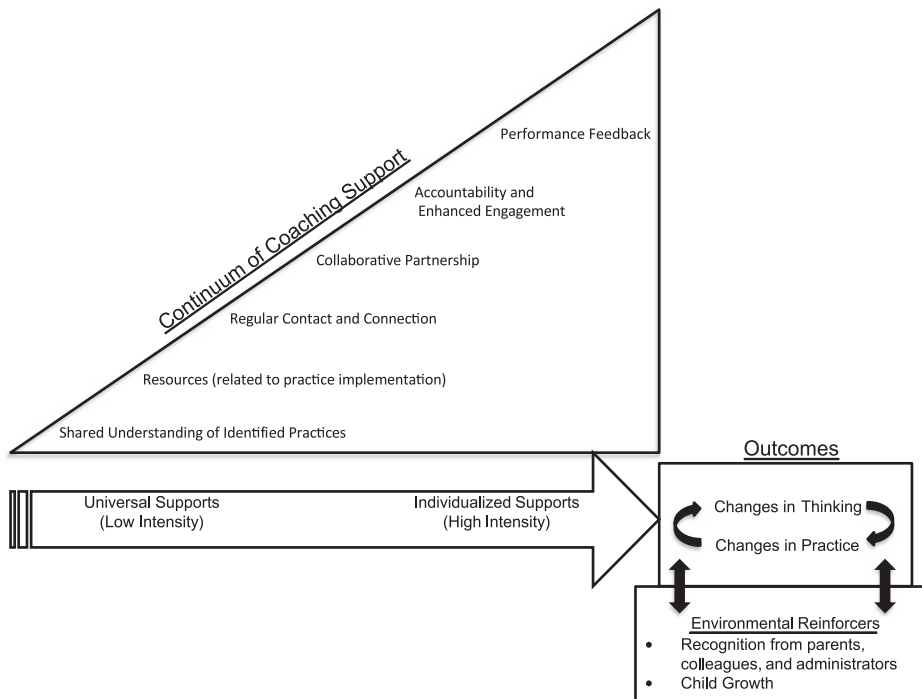


Figure 1. Change mechanisms model.

Findings

The practice of educators is embedded within a multi-layered system, which has the potential to support or challenge the quality of the classroom environment, including the interactions taking place between teachers, assistants and young children (see Figure 2). Acknowledging the complex nature of the classroom environment where the teachers' learning – changed and unchanged thinking and practices – took place is essential in understanding the variability of experience. The major constructs of this phenomenon are presented concentrically, moving from distal factors influencing the context in which the PD and teacher learning took place, to proximal mechanisms associated with changes in thinking and practices. Given the path from distal to proximal influences, the findings are organized to describe: contextual influences surrounding the learning environment; teachers' perceived and lived experiences with the PD and varied coaching formats; and participants' insights into their changed thinking and practices. The findings conclude with a description of the participant-reported challenges related to embedded instruction implementation, and concurrent recommendations for enhancement of both coaching and the embedded instruction practice content provided as part of the PD.

The learning context

Within the United States, society's understanding of early learning and development is constantly evolving. Guided by both socio-political and economic factors, the interpretation of desired outcomes for young children and proficiency benchmarks for their teachers are often unclear and evolving (Zigler *et al.* 2011). This ongoing repositioning of early childhood teachers within what has traditionally been a kindergarten–12th grade system has raised questions about the potentially

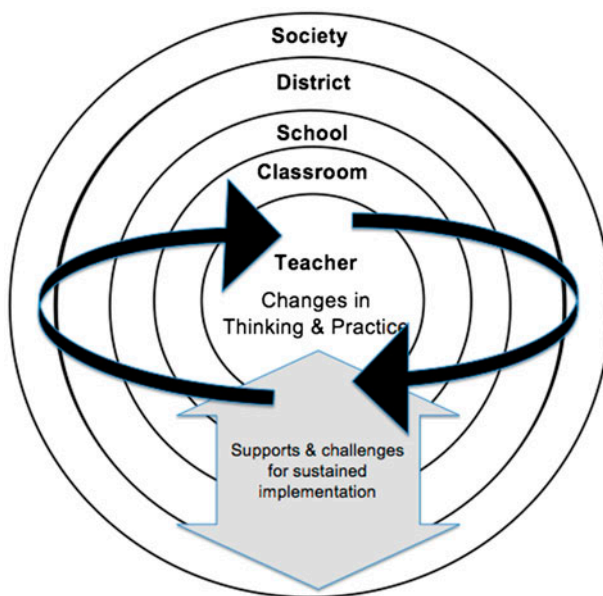


Figure 2. Learning and implementation context.

deleterious impacts of perpetuating the divide between birth to five teaching and learning experiences and the primary grades (Takanishi 2011). Several teachers described being disconnected, misunderstood or ‘isolated’ from their school and district colleagues (SiteC_EC_894–895). A teacher from Site B contrasted her on-site coaching experience with the support traditionally provided through administrative supervision, stating:

We take data on the kids all the time. It was really nice having someone take data on me. To see am I doing it? Am I not? Is there growth? ... Yet no one [from an administrative or supervisory position] comes in [to observe]. I think it was that accountability piece [in the coaching]. So many times we get in our classroom and the principal may come in twice a year and do this 30-minute observation, but then he’s gone ... (SiteB_EC_766–770)

Although teachers commented that support and knowledge of early childhood special education (ECSE) by district and school administrative leadership fell along a continuum, teachers across all sites described that essential elements of their professional role(s) were misunderstood by colleagues and supervisors outside the ECSE community, often resulting in feelings of professional isolation.

District-level administrators specializing in ECSE, however, played a significant role in communicating with university personnel and teachers affiliated with the study. For example, they conveyed to school administrators the relevance of having teachers participate in the study, and validated the additional hours worked by the teachers through the provision of district in-service recertification points. The teachers’ ability to access meaningful PD within their schools and districts was a persistent challenge, leading teachers to speak abrasively, as they expressed their frustration: ‘I’m not just going out and taking useless crap just so we can get points and get recertified’ (SiteA_EC_1904–1905). Teachers were eager to learn new strategies and to improve their practice, but sought meaningful PD. Due to the professional learning context, teachers described feeling eager, yet hesitant, when they volunteered for the study. This was most apparent in the reflections of teachers who engaged in on-site coaching as they contrasted their lived experience with their underlying fears. For example, one teacher stated: ‘[My coach] is not intrusive or intimidating. I think having the right person there is important, because you don’t want to feel like somebody’s judging you or criticizing you’ (SiteA_EC_463–465). Participating in the study opened new doors to a professional network, but sharing their practice beyond the secure walls of their classroom was uncharted territory for most participants.

Professional development and coaching

All participants who received coaching came to the partnership with a unique set of knowledge, skills and dispositions – a learning history, which interacted with the resources and coaching format they received in particular ways. Yet consistent themes emerged across participants’ experiences. The theoretical model (Figure 1) illustrates the continuum of PD and coaching support, which served as a mechanism of change for participants. PD and coaching supports ranged from universal (e.g. establishing a shared understanding of identified embedded instruction teaching practices, providing resources and establishing connections) to more individualized (collaborative partnership, including affective support; enhanced accountability and engagement; and feedback on practice implementation). Teachers in the self-coaching condition experienced less intensive support when compared with the on-site

condition despite the focus on a balanced weekly dose. Moreover, the self-coaching supports were experienced on a continuum because teachers demonstrated agency in their access to and implementation of self-coaching. For example, 6 of 12 teachers in the self-coaching condition uploaded a video of their process to receive feedback on how to engage in the practice-focused coaching cycle. In contrast, all 11 teachers in the on-site condition were guided through the coaching cycle each week. The findings related to PD and coaching describe: universal supports provided to all teachers; and more intensive supports that resulted from on-site coaching.

Universal professional development supports

Universal PD supports were provided to teachers who received coaching. These included the 16.5 hours of workshops distributed across four to six weeks and ‘job-aids’, which were considered foundational for teachers to write learning targets, implement practices and monitor progress. The material resources or job-aids included digital video cameras, access to model implementation videos and practice guides including forms such as an embedded instruction action plan and activity matrix with exemplars. Weekly check-in emails were provided to teachers in self-coaching, and weekly contact through alternating on-site and distance sessions (email, telephone, videoconferencing) was provided for teachers in the on-site coaching condition.

Shared understanding of identified practices. Workshops were intended to introduce a set of identified practices and ensure some level of shared understanding prior to coaching. During the workshops, teachers in both coaching conditions were introduced to embedded instruction practices, materials and resources. Teachers noted features of the workshops that helped to increase their knowledge and sense of self-efficacy related to the practices. First, teachers valued the systematic review of how to do concrete tasks related to the identified practices in combination with opportunities for supported practice. For example, this teacher highlights why guided practice opportunities were critical as she adopted new practices:

If we had been thrown all of [the resources] all at once, you look at that and go, ‘Oh it’s way too much’. So, [the workshops] kind of took it in these little pieces and we did this little assignment and we saw, okay, now we’re going to develop a plan ... we’re going to develop the matrix and we’re going to use that. So, I think the pacing was pretty good to get us from point A to point B. (SiteC_EC_436–440)

Another example of a step-by-step guided practice during the workshop was the use of self-assessments to develop action plans and the use of action plans to link children’s individualized education program goals to the embedded instruction learning targets or planned interactions taking place in the classroom between the teacher and child. Pulling all these documents together can be challenging for classroom teachers. As one participant shared:

[The workshop] gives you that automatic step-by-step processing ... I really like the workshop to bring out that action plan and the self-assessment ... saying: Are you doing this [embedded instruction]? Do you know what a real good goal is? Do you have this in your goals? Do you have this in your targets and to ... really stop and think am I really doing this in my classroom? (SiteA_SC_1929–1942)

Time for reflection and self-assessment about their embedded instruction practice supported the teachers by identifying potential growth areas and motivating

engagement through the explicit alignment between the implementation supports they were receiving and the teachers' work contexts. Having time was noted as a strength in some contexts. For example, a teacher said: 'we actually practiced how to write learning targets ... you actually had time to stop everything and think about it' (SiteB_EC_493–495). Yet, time was also a challenge, which will be discussed in a later section. Overall, teachers identified the systematic nature of the workshop process, including new content paired with guided practice and the tools to implement the practices in the classroom, as critical for supporting their confidence and competence to implement embedded instruction practices with children in their classrooms.

Resources

Digital video cameras, video exemplars, workshop materials and practice guides make up the resources to support practice implementation. Each of these resources and their perceived utility are explained below.

Digital video cameras. A video camera was provided to all teachers across both conditions and was introduced during the workshops. Video cameras were used for recording and reflecting on classroom practices, for reviewing and recording child data related to learning trials or for showing growth over time either in teachers' implementation of embedded instruction learning trials or in child learning or both. Although some teachers reported that more training on how to use the camera would have been helpful or indicated they and their assistants did not feel comfortable in front of the camera, other teachers embraced this resource to aid their implementation of embedded instruction. For example, teachers across coaching conditions shared the videos with parents to celebrate the success of children in their class and to illustrate growth in children's skills targeted for embedded instruction. Teachers who had not yet attempted to use the video camera expressed the desire to continue experimenting with this tool.

Exemplar videos. Exemplar videos illustrating non-study teachers implementing embedded instruction in preschool classrooms were available to all participants in the workshops, through the coaches for the on-site coaching condition and through the self-coaching website. Across both conditions, the videos were perceived as valuable. The videos showed teachers what was possible within an evidence-based embedded instruction framework, which participants overwhelmingly reported to fit with their idea of good and intentional instruction. One teacher spoke of the videos affirming and extending her instructional approach, stating: 'There was always room for improvement in different areas and when I saw the videos during the training, I was like there's something else I can do ... it was a validation and an extension of what to do' (SiteA_SC_107–114). After the workshops, there were two primary ways in which teachers reported using the videos: to review practices and to communicate and model for their classroom support staff, who had not attended the workshops, how to carry out embedded instruction practices.

Workshop materials and practice guides. Teachers in both coaching conditions were provided with several embedded instruction documents for reference, planning, implementation and record-keeping; however, these tools were not perceived to be

as independently useful as the exemplar videos. Participants said using these documents in the classroom required more intensive support. As previously noted, teachers in both coaching conditions improved in their ability to write higher-quality learning targets; yet their self-confidence and perceptions of the documents' utility did not match teachers' demonstrated skill capacity outside the workshop context. Teachers who were participating in self-coaching noted the difficulty they experienced in using these documents without follow-up support from an on-site coach, stating:

When you go to the workshop and you take [the documents], you're like yes, I knew exactly what you were talking about and then you go into the classroom and you start looking at the individual children and you're like I don't understand it. There's a difference, you're in the workshop and you're in and you think you've got it and then when you sit down with the children and your [learning] targets ... there's all these little intricate things that you have to remember. (SiteA_SC_615–622)

Although participants received guidance in how to use these resources in workshops and were provided with models for reference, additional support and feedback were desired. A teacher who received on-site coaching confirmed the statement above. As she explained it:

The individualization to be able to go, 'I don't get this. This is my question.' You can't do that with a book ... we go to all these workshops ... and it's really exciting and you learn this and you have these materials, but I just – I think any professional development model, if you don't have some kind of follow through, it's not going to get used ... There needs to be some kind of follow through to really help teach – force teachers to implement – because you want to. Our intentions are always good. But man, oh man, it just gets hard to do. So I think that coaching there was just paramount. (SiteC_EC_362–370)

Across conditions, teachers communicated the need for more intensive support when implementing new practices in the classroom. The workshop materials and initial support to demonstrate the embedded instruction practices were universally accessible; however, the utility of the materials did not transcend to the web-based self-coaching format. The teachers who received on-site coaching concurred with existing PD research about the need for follow-up and accountability to buttress the 'good intentions' of teachers who attend workshops.

Weekly check-ins

Both coaching conditions were designed to have weekly contact with teachers. Weekly contact was important to establish and maintain a connection with participating teachers and to support teachers' use of the embedded instruction practices. For teachers in the self-coaching condition, contact occurred as a weekly email that was sent from research project staff. The structured email format encouraged active participation on the self-coaching website, informed participants about new website resources and requested procedural documents from self-coaching teachers. Teachers in the on-site condition experienced weekly contact alternating between face-to-face and email coaching sessions. The bi-weekly, on-site coaching emails provided individualized notes and feedback based on the coach's on-site classroom observations and teacher-coach reflection and feedback following the observation. The emails referred teachers to specific videos, documents or other materials to implement embedded instruction practices with particular children in their

classroom. The individualized nature of the on-site coaching contacts, including the personalized emails, was significant to the participants, as evidenced by their comments, demonstrating the perceived value of universally available support manifested differently in each coaching format.

Several participants in the self-coaching group stated they did not know they had received a weekly email or did not find it useful. One teacher responded, 'I was reading through a 100 e-mails at a time' (SiteA_SC_1385–1387); others noted that required administrative tasks interfered with their ability or time to view new resources posted on the website. Given the structured format of the email, one teacher commented: 'They kind of always seem to say the same thing. Towards the end I kind of just skimmed over them to make sure nothing was due' (SiteC_SC_572–574). Two teachers who reported exploring the recommended web-based resources mentioned in the emails noted that they took personal time at home, including nights and weekends, to review suggested links. Self-allocated planning time within the busy school day was difficult to prioritize for teachers engaged in self-coaching. Furthermore, some teachers in self-coaching expressed guilt over not accessing the resources shared in the email, while others appeared to develop a fear of this non-personalized email, stating: 'I didn't miss them [the emails], every time I got one I'd go oh, what did I do wrong? Or what did I forget?' (SiteA_SC_1259–1260).

In contrast, teachers who received on-site coaching valued the personalized, on-site verbal feedback most, but also noted that customized emails served as a valuable reminder of their reflection and feedback debriefing and next steps. One teacher said:

[the email] just reminded me again [of my responsibilities] because it is at the end of the day, you're just – [tired sigh] – It's what kept me on track, more on things that I was going to look up or work on. (SiteA_EC_1426–1427)

Although both coaching conditions had a mechanism for weekly contact and establishing a connection with teachers, the individualized contact of on-site coaching including personalized emails appeared to be more effective for reducing teachers' feelings of being overwhelmed and repositioning them as knowledgeable and capable of implementing embedded instruction.

Intensive support

Across the universal supports described above, the way in which participants accessed and used the implementation supports and resources was influenced by the coaching delivery format. Coaches were in the classroom to observe embedded instruction implementation, to model how to use the resources and to facilitate the process of applying job-aids in the classroom. The on-site coaching condition contained three critical constructs associated with participants' self-efficacy and implementation of embedded instruction that were not apparent in self-coaching participants' data: participation in a collaborative partnership; accountability for implementation; and consistent supportive and constructive feedback.

Participation in a collaborative partnership. The presence of a coach made the embedded instruction knowledge, performance feedback and support readily available, in the form of a partnership. As demonstrated previously within the learning

context, teachers often felt isolated and received little external support and feedback on their teaching practices. The role of coaches fulfilled both needs. Teachers' comments regarding their coaches were overwhelmingly positive, stating they were like friends, mentors and 'one of us.' Coaching was individualized and communicated to teachers that they were doing their job well, even when they could not see it for themselves:

We didn't get a lot of praise for what went on in the classroom. So for [my coach] to come in and say, 'Wow, what a difference, what a change.' [Was important for me] just because she saw it and now I'm seeing it. Even with kids who weren't the target. Just to get feedback that you are doing something right ... I don't know about other buildings or things like that, but we don't have people walking in our room and saying those kinds of things to us. (SiteB_EC_571–576)

All coaches had expertise working with young children and were trained to implement embedded instruction; feedback was therefore perceived as both credible and non-punitive. Furthermore, coaches participated in the workshops and could facilitate teachers' application of the teaching practices by drawing on their shared learning experiences and providing specific praise. One teacher described on-site coaching as:

a collaborative effort as opposed to, 'This is what you need to work on'; it's more like 'What do you want to work on? What do you feel?' I like that aspect. It made me think and reflect and see what I needed to do. (SiteA_EC_1263–1265)

Although support was provided around an identified set of embedded instruction practices, coaches honored teachers' self-awareness and knowledge of their classroom. Opportunities for choice further developed teachers' trust and rapport with coaches.

Accountability for implementation. Coaches sustained the teachers' learning momentum after the workshop. They played a critical role in ensuring that teachers: acknowledged their successes; accessed and implemented embedded instruction with the job-aids provided; and problem-solved when challenges arose rather than abandoning their 'good intentions.' Teachers commented that coaching sessions motivated their implementation: 'And it's easy to say, oh, let's just put it off for a couple of weeks. It'll be shoved under the table, but when you know your coach is coming, you work on it' (SiteA_EC_308–309). A few teachers questioned whether they would continue completing the tasks when they no longer received coaching, because the level of accountability would decrease.

Feedback was accessible. Coaches provided both supportive and constructive feedback, which scaffolded teachers to align their practice with the evidence-based processes of embedded instruction and increase their fidelity of implementation. Teachers admitted they were unsure about receiving constructive feedback, fearing it might be punitive, but were surprised by the partnership they formed with the coach and how they came to value their presence and the supportive and constructive feedback provided:

I [liked] having someone observe ... to see what we live and then also be able to say, 'Hey, this was okay' or good or whatever, but 'This is a little way you could tweak this or you could have someone help in this situation' ... that immediate feedback was nice. (SiteB_EC_740–746)

Teachers particularly commented on the importance of feedback from the coach that included implementation data and the summary email. Teachers indicated that feedback provided them with the motivation to continue implementing embedded instruction and specific suggestions on areas to improve.

In contrast to the experiences of teachers in the on-site coaching condition, teachers in the self-coaching condition did not experience a sense of partnership. They wanted more accountability for their implementation and external feedback from a coach. One teacher noted: ‘Help would have been nice. To have somebody go through your learning targets and say hmm, “Let’s look at these again.” and “How can we maybe improve the learning targets and make them more specific to what we’re seeing?”’ (SiteA_SC_628–631). Another indicated:

it wasn’t feasible for me because I had to rely on myself to do it. If someone else was to come in and I had to have time, then I would have consciously taken that time. Otherwise I don’t do it. (SiteC_SC_576–578)

Experiences of the self-coaching teachers highlight their longing for comparable types of intensive supports provided by on-site coaching – partnership, accountability, external feedback – within the online environment.

Environmental reinforcers

Participation led to perceived symbiotic changes in teachers’ thinking and practice across the on-site coaching and self-coaching conditions (see Figure 1). When the teachers changed their practices in response to their new learning, they received natural reinforcement through interactions with people in their work environment. Positive environmental feedback reinforced the teachers’ implementation, making the new practices a valued part of classroom routines; whereas negative responses or an absence of a positive response (i.e. recognition for effort) led teachers to abandon practices and materials, concluding they were ineffective. This section describes the significance of the transactional relationship between teachers’ changed or unchanged practices and their contextual work environment.

One of the most significant changes reported was how teachers perceived the children in their classroom. They moved beyond conventional labels (e.g. voluntary pre-kindergarten, exceptional student education, dual language learners) to seeing children’s unique abilities as assets and their needs as opportunities for development of teachers’ skills in embedded instruction and, in turn, child-learning outcomes. Teachers who participated in both coaching conditions described: being more aware of their children’s individual preferences and abilities; being more intentional in their lesson planning; and communicating lesson plans and embedded instruction learning targets with assistants and other members of children’s support team(s). The ability to improve child outcomes through embedded instruction learning trials reinforced teachers’ use of the practices in powerful ways. One teacher described her multifaceted growth process:

I think that it’s made me a better special education teacher in a full inclusion environment. I think that piece is easily lost and I should say I kind of move my kids through their days and saw them being successful, but now I *know* they’re successful. Now I’m probably deeper into my IEPs (individualized education programs) than I have been able to be [in the past], which is good. It almost made me feel bad at the beginning, because I don’t [*sic*] know these kids as well as I thought I did. So, it went from feeling kind of guilty to realizing that there is a way for me to do both things [teach

children with disabilities and their typically developing peers] and do both things well. I think it brought me balance. (SiteC_EC_180–186)

Parents and colleagues also reinforced teachers' perceived value of the changes taking place in the classroom. Some teachers described how celebrating successes with enthusiastic parents and being approached by colleagues for tips played critical roles in building self-efficacy and the motivation to continue implementing embedded instruction. For example, after reflecting on the excitement of a student's increasing language, one teacher shared: 'he's talking two or three words ... I feel confident ... and today my colleagues ask ... can you help me with this child' (SiteA_EC_154–160). The combined positive feedback and emergent professional network for the continued pursuit of enhanced fidelity of implementation of practices by colleagues was important for teachers as they spent a reported 10+ additional hours a week planning, implementing and evaluating their embedded instruction practices.

Simultaneously, some teachers' responses revealed how classroom and school environments have the potential to challenge teachers' implementation. Across conditions, teachers noted time as one of the most difficult aspects of implementation to navigate. This challenge arose in relation to: familiarity with resources and how to access them; working with paraprofessionals; and balancing the provision of individualized instruction and the ability to meet all students' needs. Teachers in the self-coaching condition expressed feeling challenged more often than teachers who received on-site coaching. For example, one teacher explained how the absence of administrative and collegial support was a significant deterrent to her continued efforts to implement embedded instruction practices as intended:

I was sat down by [my administrator] and told that maybe I was focusing too much on the ESE (exceptional student education) children and I needed to focus more on the other students in the classroom, that the parents had concerns that I was spending more time on the focus children than I was on the other students. (SiteA_SC_367–396)

In the absence of a professional network or coach, teachers reported they did not possess the needed support for trouble-shooting how to respond to the difficulties of integrating new practices into their daily routine. Furthermore, they lacked the confidence and the experience to defend their use of embedded instruction practices as they worked out the kinks.

Challenges and implications for practice

The social validity data gathered in the focus groups afforded insight into opportunities for improving future PD including workshops and coaching delivery formats. Two major themes emerged: the use of the self-coaching website and associated materials was dependent on the quality of available equipment and participants' comfort with technology; and participants sought professional networks to augment their self-coaching.

Technology

Although technology has the potential to increase access to resources offered through web-based platforms (Dede *et al.* 2009), it also requires initial investments in the form of equipment and training. This study provided digital video recorders

for teachers to upload videos and a face-to-face orientation to the web-based delivery format. Despite the technical support provided, however, computer software and bandwidth were reported to be somewhat persistent challenges. The frustration of not being able to efficiently access the site was a challenge for some participants. One participant noted:

I didn't have a computer that was functioning well ... I was behind and I never seemed to get caught up ... I didn't discuss it with anyone, because I felt like I was a naughty child not doing my work ... I'm already behind so let me just continue with what I know how to do. (SiteA_SC_264–271)

In this reflection we hear 'good intentions' mixed with fear of punishment and a desire to feel competent. Difficulty with technology demonstrates the importance of knowing participants' learning histories and work context to ensure support is readily available, especially when introducing new knowledge (i.e. embedded instruction practices) in combination with a new learning format (i.e. a web-based self-coaching delivery). Even those who expressed comfort and a commitment to using the website noted technological difficulties. For example, one teacher said:

I had trouble at my school watching the videos and stuff. My computer would just freeze ... I could do it at home, but I couldn't do it at school. I tried to share it with [my teaching assistants], and it was just so [motioning slow] – you'd get half way and then it would just freeze. ... So that was frustrating when I wanted to share [the videos]. (SiteC_SC_63–68)

Based on this feedback, it became apparent that prior to engaging teachers in web-based PD, providers should: assess teachers' technological self-efficacy and baseline knowledge of the delivery format; make on-site assistance available; and work with district personnel to ensure access to current technology, required software and adequate bandwidth.

Professional networks

Across conditions, collaboration with colleagues who had a shared vision for high-quality instruction around embedded instruction practices surfaced as participants discussed potential supports for continued implementation. As one teacher shared: 'I think it would be nice for us to get to talk and then we could build up a community ourselves ... then maybe if we had questions, we could e-mail each other about it' (SiteA_EC_400–403). Another participant concurred, adding: 'we could be each other's support system' (SiteA_EC_405). Echoing the need to circumvent feelings of isolation associated with often being the only ECSE teacher at their school, one teacher suggested a discussion board might allow teachers to flexibly share ideas and resources. Teachers felt a professional network could provide additional accountability too:

It would be nice to have all the embedded instruction people ... to discuss what we're going to do for the upcoming year, how we're going to implement. Maybe even make ourselves partner up with somebody and make ourselves check-in, 'Are you doing it?' Just saying, 'What are you doing, how is it coming?'" (SiteA_SC_1754–1760)

The potential face-to-face, online and blended formats for implementation support described by participants across conditions demonstrate that teachers want a professional network for support, sustained momentum, continued learning and accountability. Future PD involving coaching, especially when adopting a web-based

delivery format, could structure a supportive partnership or professional network where participants can engage with colleagues about their experiences as they implement new practices.

Discussion

Teachers are situated within complex environmental systems, which facilitate or constrain access to both human and material resources (Bronfenbrenner 1979). The experiences of focus group participants offered important insights into: the intersection of evidence-based practices and the organizational and ecological realities of classrooms; the acceptability, feasibility and utility of two variant forms of practice-focused coaching; and the required level of support to implement a multicomponent intervention such as embedded instruction. Currently, the gap between research and effective implementation of evidence-based practices within the classroom context has been documented to be in excess of 20 years (Metz *et al.* 2013). Odom (2009) contends the extent to which educators perceive new practices to be useful and accessible impacts their motivation to learn and their ability to implement the practices. Therefore, it is essential for PD providers to make explicit and intentional connections between evidence-based practices and the classroom context to increase effective implementation. To accomplish this, PD providers require knowledge about: for whom practices are likely to ‘fit,’ including teachers’ beliefs and values and their classroom and organizational context; what teachers need to know and be able to do to implement; and how to facilitate the learning process (National Professional Development Center on Inclusion 2008). For example, within this study it became apparent that self-coaching in a web-based delivery format required individual participants to have a strong grasp of the content, self-motivation and technological self-efficacy to successfully access the available supports. However, even teachers who possessed all of these characteristics still described implementation to be challenging in the absence of a network of support or accountability. Despite the potential for broader access with web-based delivery formats (Dede *et al.* 2009), the present study highlights the importance of examining the mechanisms that result in effective PD across delivery formats (Snyder *et al.* 2011).

Moreover, McCollum and Catlett (1997) suggest a relationship exists between what teachers need to know and be able to do (i.e. implementation of evidence-based practices) and how the learning process is facilitated. That is, the degree of teacher change:

is assumed to be related to the degree of active involvement that the participant has in the training process, with active involvement defined as the extent to which the learning activity allows the participant to experience knowledge, skills, and attitudes in the same way they will be required in the work setting. (McCollum and Catlett 1997, p. 115)

Teachers who received on-site coaching had sustained opportunities to experience the use of embedded instruction practices in the context of a supportive coaching partnership with regular supportive and constructive feedback, which facilitated their increased level of implementation.

Recognizing that more intensive forms of PD are likely to require additional human and material resources, sustainable and scalable implementation of these delivery formats might impede their adoption. Implementation science has emerged

in response to the research-to-practice gap and seeks to inform organizations and providers of early childhood education about a framework designed to install and improve infrastructures required to effectively adopt evidence-based practices. This framework includes five stages: exploration; installation; initial implementation; full implementation; and sustainability (Metz *et al.* 2013). Through these stages, organizations can ensure individual PD initiatives are responsive to who, what and how learning takes place; but can also establish the ecological system for supporting PD providers and teachers.

Children and teachers will always be situated within complex systems; however, it is the pathways forged through shared understanding toward common goals, acknowledgement of teachers' lived experiences and the establishment of intentional infrastructures to support those goals and experiences that will close the research-to-practice gap with the aid of well-aligned PD models. The present study has provided teachers' insights into their lived experiences of practice-focused PD and coaching while contrasting these experiences across delivery formats to contribute to the theoretical and empirical PD evidence base.

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